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HYDER ALI.

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The subject of this paper has no direct connection with the history of the Mogul empire, to which several preceding papers have been devoted; but as Hyder Ali may be said to have partially raised himself upon the ruins of that empire, we have thought a short account of so remarkable a man may not unfitly follow the sketches in question.

Mahomed Beloli, the great-grandfather of Hyder, was a fakir, who left the Panjab for the Deccan, where he acquired considerable property. His grandson Futtee Mahomed, the father of Hyder, was driven by the ill usage of his relatives to accept the post of a common foot soldier. In this position he distinguished himself, and soon obtained some rank in the service of the nabob of Sera, and when that prince was dethroned, perished bravely, fighting in defence of the nabob's family. He left a widow and two sons, who all obtained the protection of the widow's brother, a soldier enjoying some petty rank under a Bangalore officer. Shabus, the eldest son, was recommended to an officer in the service of the rajah of Mysore, and his promotion was rapid; but the youngest, Hyder, up to the age of twenty-seven, spent his whole time in riot, luxury, or in the pleasures of the chace. In 1749, however, he joined the army of Nunjeraj, the rajah's minister, as a volunteer, in the attack upon the castle of Deonally, and exhibited so much courage and address as to draw upon himself the notice of the general, who rewarded him with the command of 50 horse and 200 foot soldiers, and committed to his charge some of the gates of the conquered fort. His rise was now very rapid. He engaged in his service a body of men common in India, a kind of banditti-soldiery,

who attached themselves to particular chieftains, but were satisfied to provide for themselves in the matter of payment. Hyder agreed with these men to divide equally the spoil they should obtain under his command, and although he had never learnt either to read or write, contrived his checks upon them so skilfully as to make fraud all but impossible. Nothing could be too good, nothing too mean for these freebooters; their attacks were made, with the utmost impartiality, upon men, women, and children; they took the merchant's gems and the earrings of the poorest female traveller with equal avidity—clothes, grain, horses, nothing came amiss, and by this systematic plunder did Hyder at last obtain sufficient wealth to employ, equip, and buy a more formidable as well as more creditable body of soldiers. All this was done whilst he was occupying for Nunjeraj the important citadel of Dindigul, which he had entered with a very humble detachment, and which he quitted the master of an army. He had now under his command 1500 horse, 5000 infantry, and four guns.

The kingdom of Mysore was at this period distracted by internal dissensions. The rajah was held in a state of bondage by his two ministers, Nunjeraj and his brother Deoraj. The latter however at last retired from public affairs. The troops of Nunjeraj having mutinied for payment of arrears, Hyder interposed as a friend to all parties, and succeeded in making peace, for which service however he took care to be well rewarded by an assignment of a considerable tract of country. The invasion of the Mahrattas enabled Hyder to advance another step in his upward career. He was placed at the head of the defending army, and so well did he conduct its affairs, that he forced from the enemy an advantageous peace. His patron Nunjeraj now alone stood between Hyder and the highest office of the state a subject could hold—that minister was therefore to be got rid of. This was accomplished by Hyder's practising upon the rajah's dislike of his minister, and thus drawing him to the accomplishment of the following scheme. The troops of Nunjeraj, being again in arrear of pay, were easily invited to mutiny, and to demand that Hyder should be placed at their head. The rajah interfered, and offered to pay the troops, if Hyder would renounce his connection with Nunjeraj, and become his prince's obedient general. Hyder professed to feel great reluctance to the adoption of the first condition, but was at length induced to give way. Nunjeraj of course was too quick-sighted not to understand the meaning of all this, and to perceive his danger; he therefore at once offered to retire upon an honourable pension. Hyder was now commander-in-chief of the rajah's forces. That prince was now allowed a greater share of liberty than he had previously enjoyed, although Hyder was quietly obtaining possession of the country. At this period more than half the kingdom of Mysore had been given up to him in order that he might pay the arrears of the soldiers' pay and provide for the future.

Whilst engaged in hostilities with a neighbouring state, Hyder's fortunes had nearly come to an untimely conclusion. He had left himself with a small force in the capital in the neighbourhood of the rajah's palace, under the very guns of which his camp was situated, and the spot was surrounded by water unfordable when the tide was in. The rajah's mother, who felt acutely the danger of the rajah from a man of Hyder's talents, ambition, and courage, resolved upon the bold step of attacking him where he lay, and thus ridding her son of so formidable a minister. With this object she secured the assistance of a Mahratta general, but before his arrival, seeing the river was full, she commenced the attack. Hyder's position was desperate, but the Mahrattas not arriving till after nightfall, he succeeded in the darkness in crossing the river with a few followers in some boats, leaving his family behind. He now travelled 98 miles in the short space of twenty hours to reach the important fortress of Bangalore, so that he might have at least a stronghold in his power where he could remain till joined by his absent troops. The fortress he knew would be closed against him if the knowledge of the recent event preceded him; this however his diligence prevented. His troops were still unable to join him, owing to the Mahrattas, who interposed, and Hyder's ruin appeared inevitable, when he was saved by the unconscious efforts of the very people, the English, whom he afterwards opposed and reduced almost to the very brink of ruin. We allude to a treaty made just at this time between the English and the Mahrattas, by which the latter were bribed to return to their own country. The moment Hyder was aware of this circumstance, he offered an additional bribe to ensure their compliance, which of course they received.

Hyder was now, not unnaturally, in open hostility to the rajah, whose forces however were more formidable than his own. To remove the inequality, Hyder adopted a measure which, as Mr. Mill truly observes, "it required Oriental hypocrisy and impudence to form, and of which nothing less than Oriental credulity could have been the dupe." He presented himself, an unarmed suppliant, at the door of Nunjeraj, and on being admitted to the presence of his former patron, threw himself at his feet, acknowledging the wrongs he had done him. He wished now to devote his life to Nunjeraj's service, and in accordance with that object solicited a cordial union of their strength to re-establish the deposed minister in his former rank. Nunjeraj listened and believed—he confided to Hyder his army, his name, and his influence, which, aided by the successful accomplishment of another trick, enabled Hyder to seat himself upon the long-desired throne. He had been followed, on his visit to Nunjeraj, by a detachment of the rajah's army, the main body of which was confronted by the main body of his own, and now found himself on his return intercepted, and in great danger. To relieve himself he forged letters in the name of Nunjeraj, which were addressed to certain of the principal officers in the rajah's army, and from which it might be gathered that there was a conspiracy among the former to seize their general and deliver him to Nunjeraj. The bearer of these letters took care to be discovered; their contents were examined by the general himself, who fulfilled Hyder's fondest hopes, by at once running away. During the confusion that resulted, the rajah's army was attacked by Hyder himself in front, and by the main body of his army in the rear, and an easy victory obtained. Hyder now sent the following message to the rajah: "That large sums were due to Hyder by the state, and ought to be liquidated: after the payment of these arrears, if the rajah should be pleased to continue him in his service, it was well; if not, Hyder would depart and seek his fortune elsewhere." The rajah now saw further opposition was useless; he agreed with Hyder to retain only certain districts from which revenues might be drawn to the amount of three lacks of rupees for himself and one for Nunjeraj, and that all the rest of the country should be given up to Hyder, who was of course to bear the weight and charges of government. Hyder was now undisputed sovereign of Mysore!

With the utmost diligence did he now apply himself to the consolidation of his power, which at last grew so formidable that the Mahrattas, the Nizam of the Deccan, and the British, concluded a treaty against him; but Hyder's skill in negotiation was so successfully employed, that he not only broke up the alliance, but brought even the Nizam to his own side, and induced him to join in the war against the English now maintained by Hyder. This war was begun in 1767, and continued for two years, when Hyder, by another of those felicitous strokes which his genius seemed ever ready to prompt at the decisive moment, put an end to it by enabling him to dictate the terms of peace. By a series

of artful evolutions, he drew the entire English army to a great distance from the seat of the presidency, Madras; then suddenly marching, at the head of 6000 horse, 120 miles in three days, he appeared in the immediate vicinity of the English capital, to the great consternation of its inhabitants. The citadel was beyond his power, but the open town, with all its immense riches, lay completely at his mercy. The result was that Hyder's terms were accepted, namely, mutual restitution of conquests, mutual aid and alliance in defensive wars. This treaty, the fact can neither be denied nor explained away, was basely violated by our countrymen, for only the next year Hyder was attacked by the Mahrattas and reduced to great difficulty; and although his applications were as incessant as his necessities were urgent, he could not obtain the assistance solemnly promised to him: he was left to his own resources, and in consequence obliged to conclude a disadvantageous peace in 1772.

This check was soon recovered, and by 1778 his dominions were in the best order, his revenues greatly improved, himself very popular, and his army admirably disciplined and officered. The Mahrattas appearing again in great force, he once more sought to conciliate the English, and induce them to enter into a sincere alliance, but the measures they pursued convinced him that such hopes must be dismissed, and that his sole reliance must be on himself. In 1780, therefore, he poured a vast army into the Carnatic, where the English did not appear to have expected him, and certainly were not prepared for him, whilst they were at the same time conscious that their conduct towards him left them nothing to expect but hostility. Hyder's forces were 100,000 strong, a considerable portion of it commanded by European officers, and he had 100 pieces of cannon. The whole country, even to the very neighbourhood of Madras, was overrun, and the people, who had become thoroughly disgusted with the united government of the nabob and the English, hailed him as a deliverer. A most material consequence of this was that Hyder invariably received accurate reports of every movement of the enemy, while the English were as constantly at a loss to discover his operations. The war on the part of the English was principally defensive, and they found even that limited task a most arduous one. Hyder fought no pitched battles, in which he knew the English were sure to conquer whilst there was any reasonable proportion in the amount of forces on either side; he confined himself to harassing them by forced marches and unexpected attacks, here cutting off a convoy and there a detachment, suffering a partial defeat to-day, and by celerity of movement taking some important town or fortress on the morrow; above all, by ravaging the districts around the English troops, he kept them constantly suffering under the privation of food. The enormous amount of his cavalry greatly facilitated these tactics. At last, completely dispirited at the deplorable results of a two years' campaign, seeing the English resources declining and the enemy's increasing, Lord Macartney offered peace in 1782. The answer was a temperate and dignified, but therefore all the more powerful rebuke of the former violation of treaty, in which the proposal was indirectly rejected. For another year the war continued, and with similar results. The French were now engaged in hostilities with our countrymen, and had formed an alliance with Hyder, a circumstance that greatly emboldened that enterprising warrior, and distracted the councils of his enemy. By his unceasing attacks Hyder had driven immense crowds of people into Madras for shelter and safety, and their number added greatly to the severity of the famine which was raging in the capital. The multitudes of dead and dying were so great as to raise fears of a new calamity, the plague; the dead bodies were collected daily in carts, and buried in large trenches without the town, and for several weeks not less than from twelve to fifteen hundred a week were thus disposed of. The utter ruin of the presidency seemed impending, when the whole aspect of affairs was changed by the death of Hyder, which took place in the December of 1782, at an exceedingly advanced age.

Measured by the feelings and principles of his age and country, Hyder appears free from any deep stain upon his conduct as a man or a sovereign; as a warrior he must rank high under any test. Neither the troops he had to command nor those he had to oppose allowed him to adopt a line of policy that could display the most brilliant qualities of a great warrior. To accomplish his end he was compelled to use means that may be characterised as comparatively insignificant; he harassed the enemy rather than fought with him; the warfare was a series of light skirmishes rather than the solid evolutions of a regular campaign. And this very policy it is that, we think, stamps him as a great warrior. It is this skilful adaptation of his instruments to his purposes, neither allowing his confidence in superior numbers nor the skill with which he knew he could direct them, to tempt him from the path he had marked out, that proves him to have been no common man. He saw and fully appreciated the prowess of our countrymen, and turned the knowledge to the best advantage by assailing them only where they were weak. The result was, as we have shown, success; and success which his death alone perhaps prevented from being carried farther than even his most ambitious expectations could have led him to expect.

FIRE-PROOF ASBESTOS CLOTH.

It has been known for ages that the fibres of a peculiar mineral, called *asbestos* or *amianthus*, might be woven into a kind of cloth capable of resisting great heat; but it was not till about the year 1830 that the idea of applying it to a useful purpose in this country seems to have arisen.

Chevalier Aldini brought under the notice of the Royal Society some remarkable proofs of the incombustibility of asbestos cloth. With a glove made of this substance he was enabled to handle a red-hot poker; as were several others of the persons present. He stated to the meeting that his object was to provide a dress which should enable a man to contend against the fiercest heat in time of fire or other similar danger. He showed that a finger, enveloped first in asbestos, and then in a double case of wire-gauze, might be held in the flame of a spirit-lamp or candle for a long time before inconvenient heat was felt. A fireman, having his hand in a double asbestos glove, and guarded in the palm by a piece of asbestos cloth, laid hold of a large piece of red-hot iron, carried it slowly to the distance of 150 feet, set straw on fire with it, and then brought it back to the furnace, the hand not being at all injured in the experiment. In a second experiment the fireman put on an asbestos cap over his whole head, a wire-gauze cap over that, and a cuirass defended by a shield on his body. A fire of shavings was then lighted in a chafing-dish, and the fireman plunged his head into the middle of the flames, with his face towards the fuel, and in that way went several times round the chafing-dish for more than a minute.

A short time before M. Aldini arrived in London, he submitted his experiments to the Royal Academy of Sciences at Paris, who ordered a Report thereon to be drawn up by M. Gay-Lussac. One of the experiments then exhibited was an extraordinary one. Two parallel hedges, about three feet distant from each other, were formed of straw and brushwood, piled upon bars of iron. When these were set on fire, the flames from the two rose in a body to the height of at least nine feet, and filled the entire intervening space. The heat was too great for an ordinary spectator to approach within eight or ten yards

of the burning hedges. Six men, dressed in clothing of which asbestos cloth constituted a part, now entered between the burning hedges, and traversed the whole extent several times. One of the men had at his back an osier basket covered with wire-gauze, and in the basket was a little child eight years old, clothed in asbestos cloth. The whole six men, together with the child, remained enveloped in the intense flame for some time, and emerged unhurt, nor otherwise affected by the heat than in an elevation of the pulse.

The dresses worn on this occasion were two in number, one of wire-gauze, which prevented the entrance of flame, on the principle of Davy's safety lamp; and an inner dress of asbestos cloth, to keep the wearer from the effect of the heat, which, notwithstanding the exclusion of flame, passed through the meshes of the wire-gauze. In order to allow a quantity of air to be available for the wearer, for the purposes of respiration, it would probably be necessary to cause a pipe to be conveyed from the asbestos dress to some external station open to fresh air; indeed we believe that some such contrivance as this has been adopted in a fire-proof dress devised for firemen within a few years.

Our object, however, on the present occasion, is to speak of the peculiar mineral which admits of such an extraordinary application. *Asbestos* is a name given to several kinds of a mineral found in most countries, but chiefly in Savoy and Corsica, where it occurs in the form of veins in rocks of serpentine, mica-slate, and limestone. Among the different kinds are *amianthus*, which occurs in long, parallel, extremely slender, and flexible fibres; *mountain leather*, finely interwoven and closely matted filaments, forming flat pieces; *mountain cork*, fibres interlaced so as to form numerous cells resembling cork; *mountain wood*, hard, brittle, slightly curved fibres; and *common asbestos*, compact fibrous masses, harder and heavier than the other varieties.

Amianthus is the variety most useful for being converted into cloth, from its fibrous nature; and the little alteration it undergoes by strong heat, caused it to be used by the Eastern nations as an article for the fabrication of cloth, which might be cleaned by throwing it into the fire: the dirt or grease was burned off without damaging the texture of the cloth, from which circumstance it obtained the name of *amianthus*, "*undefiled*." Table napkins were made of this substance, and, after a banquet, they were all thrown into a fire, from whence they were removed clean and unsullied. Pliny relates that amianthus cloth was also used to envelope the bodies of kings during certain ceremonies after death.

The account which has been given of the mode of making cloth from these mineral fibres is as follows:—Having steeped amianthus in warm water, divide its fibres by gently rubbing them together between the fingers, so as to loosen and separate all the extraneous matter; then pour on repeatedly very hot water, as long as it continues to be in the least discoloured. After this nothing will be left but the long fibres, which are to be carefully dried in the sun. The bundles are then to be carded by very fine instruments, and the long filaments thus obtained steeped in oil to render them more flexible. A small quantity of cotton-wool or flax is next to be mixed with the fibres, but so little that the amianthus shall decidedly predominate. These materials are then to be spun into a thread by the spinning-wheel, and in a manner much resembling other kinds of spinning. This thread is woven into a cloth; and the cloth is next to be deprived of the flax or cotton mixed with it: it is therefore to be placed upon a clear charcoal fire, and made red-hot. When the extraneous substances have been removed by this means, the cloth presents itself as a pure white tissue of amianthus. Sometimes, if great care be observed, the amianthus can be woven into a cloth without the aid of any other substance: this is done by soaking and rubbing the fibres until they attain a high degree of softness.

Cloth is not the only article which has been made from this substance. Paper has been one of the results also obtained from it. The very short fibres which separate during the repeated washings which the mineral undergoes for the preparation of cloth, may be worked into a rough kind of paper. For this purpose they require to be well beaten until reduced to an impalpable powder, and subsequently worked up with a large quantity of size in water. These precautions are more necessary for paper made of amianthus than for the common paper made from linen rags, &c., in consequence of the much greater weight of the former substance. When the paper has been formed in the usual way, the size is burnt or melted out by the application of heat. This is according to the description which has been given of the mode of making asbestos or amianthus paper; but when the size is burnt out, there appears to be nothing to prevent the ink from spreading.

An English writer, a few years ago, wrote a short pamphlet, and printed it on amianthus paper, which he made himself. There is also a book preserved in the royal library at Paris, printed on this paper. But it is probable that unless some great improvements were to take place in the mode of preparing the mineral, the incombustibility of the paper would be the only virtue to counteract the disadvantages of its being heavy, coarse, weak, liable to blot, and not capable of receiving a clear impression from types.

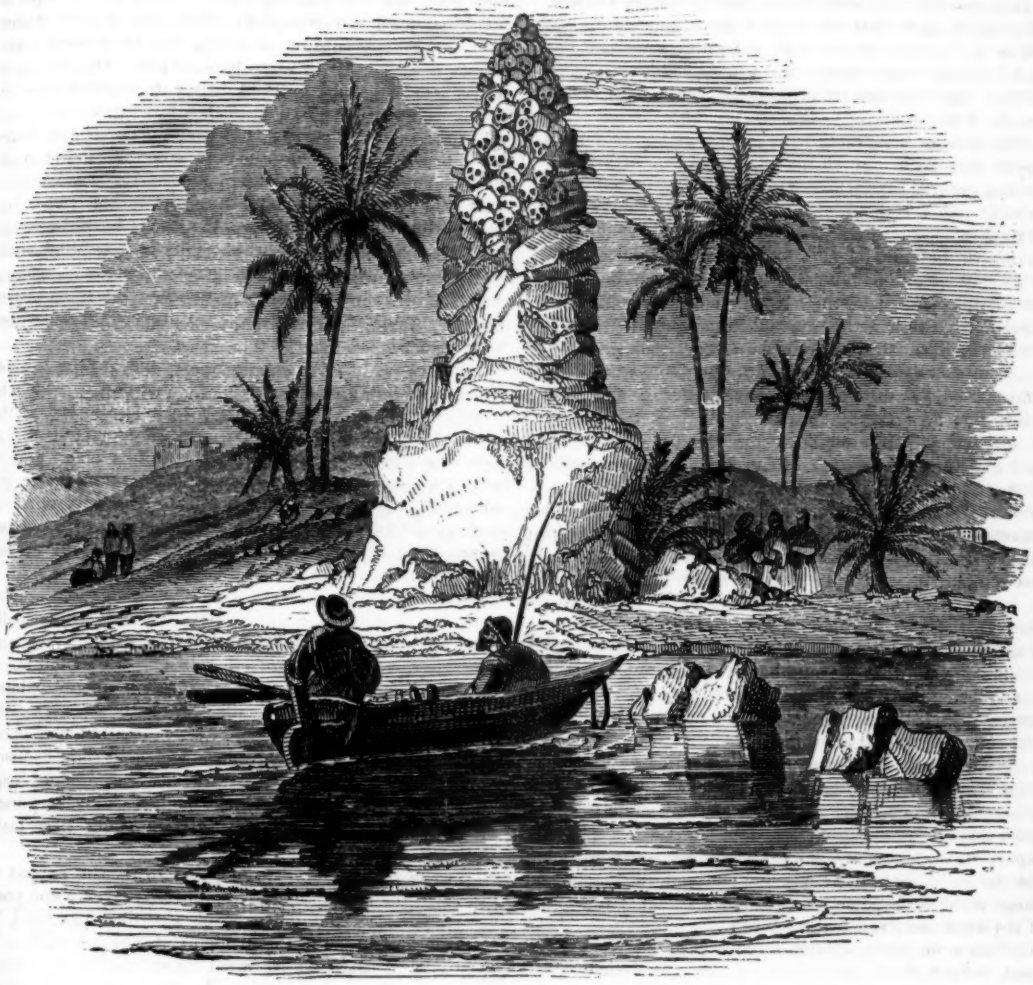
It is said that lamp-wicks have been made from amianthus, but that they require to be cleaned occasionally from the lamp-black, which accumulates upon them and prevents the due supply of oil. In Corsica amianthus is employed in the manufacture of pottery, by being reduced to fine filaments, and kneaded up with the clay; the effect of which is to render the vessels less liable to break from sudden alternations of heat and cold than common pottery. Threads, nets, net-work, head-ornaments, napkins, table and funeral cloths, bonnets, gloves, purses, girdles, and ribands, have at different times been made of this mineral.

We may mention, in connection with the subject of fire-proof materials, that an account was given some years ago in the scientific journals, of a method practised by Dr. Fuchs, member of the Academy of Science at Munich, by which he could render wood incombustible by coating it with a certain composition. To obtain this composition he collected some moist, gravelly earth, and washed it free from any heterogeneous substances, and afterwards dissolved it in a solution of caustic alkali. When spread upon the surface of wood, it was said to resist the decomposing agency of both fire and water. The building committee of the royal theatre tried the efficacy of this composition on two small buildings erected for the purpose; they were built of wood, and were exactly alike, except that one was coated with the composition, and the other was not. Fire was then applied in an equal degree to both: the uncoated building was soon consumed, while the other remained perfectly uninjured. The theatre was then coated with the composition, the quantity of surface amounting to 400,000 square feet, and the expence of the process to about 4000 or 5000 francs. We are not aware how far the employment of this method has extended in other instances.

It may be useful to state that wool saturated with a solution of sal ammoniac and borax or alum has been found to acquire a power of resisting a very considerable degree of heat. It burns after having been some time heated highly, but does not even then burst out into flame. Its power of resisting a high temperature is far less than that of asbestine cloth; but as all the materials can be readily procured, there may be circumstances in which the application of such a process would be both easy and valuable

SKETCHES IN THE BEYSHIP OF TUNIS.*

Continued from No. 475.



[Tower of Skulls of Christians, on the Island of Gerba.]

Specimen of Turkish Government.

Gerba was formerly a perfect gold-mine for its governors, who were bound to pay over to the Turkish sultan a certain annual sum of money, of no very considerable amount; in return for which they were privileged to plunder the inhabitants according to their own good will and pleasure. This appointment has been vested in the family of the Bernaiaths of Tunis from time immemorial. The present Sachab Ettaba having however contrived to raise himself from the humble station of a slave to that of prime minister to the Bey, he took no scheme more ardently to heart than that of replenishing his master's empty coffers; and with this object in view, personally visited the several provinces. Gerba was one of the spots he explored: and the governor, being prepared for the honour, received him in his house, which was decorated in a more than princely style. The keen-eyed satrap feasted on this display of splendour and magnificence with greedy look, and returned to Tunis. Shortly afterwards he ordered the governor to appear before him, and thus accosted him: "You have shown some dexterity in transferring thy master's substance into thine own chests;—thou hast built thyself houses and set them off in costly array, whilst our lord and master was in utmost need, and hast well deserved to be hung up and have thy property taken from thee: but out of pure friendship, I will make thee a present of thy life, it being understood that thou payest two millions of piasters into the treasury forthwith, and never venturest to set foot in Gerba again. The first part of the condition was fulfilled without demur, but the family of the Bernaiaths could not digest the humiliating terms of the last. A negotiation was therefore set on foot with the exasperated minister, and pursued with unremitting ardour until he was brought to relent. The disgraced governor was restored to favour, and confirmed anew in his post of kaid of Gerba, though on a very different footing. Ten of the principal inhabitants of the island have been associated with him as councillors, and he has been prohibited from levying any dues or imposts without their concurrence. The prime-minister also fixed the yearly tribute at 130,000 piastres, which are collected by the ten councillors upon a moderate estimate of each man's means, and remitted to the bey, from whom the governor receives his salary. The people of Gerba are no longer under the necessity of pretending poverty, but every one is at liberty "to do what he likes with his own,"

* From 'Missionary Travels,' by the Rev. J. Ewald, published in Germany, 1839.

and display his wealth in the full glare of day; a common occurrence under the new order of things.

Monument of the Skulls of Christians.

In their social intercourse the Gerbese display remarkable refinement of manners; their deportment is pleasing and urbane; there is so complete an absence of contempt for Christians, that one would be almost tempted to forget that they are deadly enemies to their faith, were it not for the horrifying memento of their hatred of the Christian name which stands on the sea-shore,—a pyramid constructed with the skulls and bones of Christians. During the last contest between the Spaniards and Moors on this island, eight hundred gallant combatants threw themselves into a fort near the shore, and here defended their post bravely. The Moors made several attempts to take it by storm, but were always driven back with considerable loss, and three of their leaders were killed, while not a single Spaniard had been injured. But the scourge of those who are besieged now overtook them—the means of sustenance failed them. Our handful of Christians tarried, day after day, for hope of succour and relief; none came near them. Driven by famine, the garrison capitulated, and an unmolested retreat was promised them. Scarcely however had the Moors been put in possession of the fort, than they fell upon their 800 unarmed adversaries, slaughtered every individual among them, and, collecting their skulls and bones, erected a monument on the sea-shore, that bears record of their own barbarity. It has remained standing ever since, and from time to time is washed with colour. The Moors who fell in the struggle with these brave Spaniards lie interred in the vicinity of this pyramid. The number of their graves would lead one to conclude that the number of Moors who perished was considerable. A chapel has been erected over the graves of their three leaders. I was singularly affected on first contemplating this unnatural memento of Moorish perfidy. The grey bones appeared to me as if they moved, and the arms, as if they stretched themselves out to me;—it seemed as if the hollow skulls beckoned to me, and every fleshless mouth cried out, "Depart, pilgrim, depart and seek your Christian brethren, and tell them that we have, for whole centuries, endured this thrall, and found no abiding-place for our bones. Haply the sound of thy voice may reach the ear of some godly prince, and our bones may at last be deposited within the soil that gave us birth."

The Mahometan Sect of the Wechabites.

The people of this delightful island (Gerba) are, as is the case throughout the northern coast of Africa, Mohammedans. They are usually divided into the two sects, Hanafia and Malakia. But I met with a third here, the sect Wechabia, or the Wechabites, schismatics of Mohammedanism, to which upwards of four-fifths of the islanders adhere. They have a language of their own, differing altogether from Arabic, but of kindred with the language spoken in the interior of Africa and about the Atlas mountains; they possess their own mosques and teachers; marry among themselves only, and look upon every other Mohammedan as an unbeliever. Many Arabs of the mountains in the interior are followers of this sect, and it is probable therefore that the Wechabites of Gerba (or Dsherba) are an offset from them. They are held in great detestation by the rest of the Mohammedans, who persecute them wherever they chance to constitute the majority. The Mohammedans universally take off their slippers when they pray; but the Wechabites go further, doff their trowsers, and pray *en sansculotte*. The Mohammedan, when praying, raises his hands aloft, and twice exclaims, "Allah ha Akbar!" while the Wechabites, on the contrary, let their arms and hands drop, and cry four times aloud, "Allah ha Akbar!" They disclaim all comments on or expositions of the Korân, confine themselves exclusively to its letter, and style themselves Sunites, or true believers.

I very soon formed an acquaintance with a well-informed Wechabite, and had long and frequent conversations with him. From this party I collected the subsequent information with regard to their religious principles. "We believe, in unison with the Korân, that the Almighty has from eternity foreknown what human being will be good and what wicked; Paradise being reserved for the good, and hell for the wicked. When a man is once consigned to hell, he can never be released from it. We believe it to be necessary, in order to please God, to lead an honest and sober life, and to observe good faith in all things. We agree with all Mussulmans in the five cardinal doctrines; but we are far from believing with them, that he who has continued in a career of uninterrupted wickedness for a series of years can obtain remission of all his sins by merely making a pilgrimage to the prophet's tomb. What profit can such a pilgrimage bring to a wicked man? The heart remains unchanged and is no ways bettered in after-days. We do not believe with other Mohammedans, that a man who chants the 'La illah, illa Allah, Mohammed rasuhl Allah!' before his breath leaves him, secures Paradise to himself. O no, none enters it but the virtuous man. A bad man, though he may repeat the cry a hundred times over, has the never-ending pains of hell for his reward. We are likewise far from holding, like the rest of the Mohammedan world, that man remains for a certain period only in hell; far from this,—he who has once been cast into hell, must abide there for ever." The Wechabites consider it an act of great sinfulness to smoke tobacco or take snuff. The Abadites, a collateral branch of this sect, of whom there are several in this island, though they agree with the parent stem on all these points, have superadded several extraordinary usages to the Wechabite system.

IMPROVEMENT OF THE MENTAL FACULTIES

[From a Lecture, by Thomas Arnold, D.D., Head Master of Rugby School, on the Divisions and Mutual Relations of Knowledge. Read before the Rugby Literary and Scientific Society.]

The pure sciences are all engaged either with mind, or with the operations or with the ideas and abstractions of the mind; none of them have to do with real material nature. Now the human mind may fitly be called that great and universal machine by which we operate upon all things. We all know the fame which was so deservedly obtained by the late Mr. James Watt, for his great improvements in the steam-engine. The value of the steam-engine consists not only in the magnitude of its powers, but in the generality of their application. It is useful not for one purpose only, but for hundreds. How different are the callings of the cotton-manufacturer, the brewer, and the packet-master or coach-proprietor; yet steam serves the purposes of them all. Now if the steam-engine be so general an instrument, the human mind is yet more so. Nothing absolutely can be done without it, and who can set bounds to what may be done with it? In improving then this universal engine we are conferring a service on mankind something the same in kind with the improvement of the steam-engine, but in degree and extent of usefulness beyond all comparison greater.

Unhappily, however, there has either been no James Watt to perfect this mightier engine, or his directions have been despised or neglected; or mind being less manageable than iron and steam, the engine has refused to be moulded according to the model proposed for its improvement. For it is notorious that minds of equal natural power are most unequal in their practical efficiency, and that many persons with considerable talents and favourable opportunities are unable to avail themselves of either to any good purpose, because the cultivation of their mind has been wholly neglected. Now

the mind is a universal instrument through its reasoning powers, its judgment, and its power of rapid and extensive combination. By the reasoning powers I understand the faculty of coming to a true conclusion from premises or data which are undisputed; the power of making the most of our materials of knowledge. As a familiar and most admirable example of this, I may refer to the Elements of Euclid: all that we set out with in this case are three simple postulates, or things required to be granted; and from these three are drawn, by the strictest process of reasoning, all that variety of truths respecting the properties of triangles, circles, &c. which fill a whole volume. Now all these truths are really contained in the postulates, axioms, and definitions of the two first pages; yet how few persons would have been able to discover and to prove them. This has been done by the power of reasoning; the power, that is, of finding out all the truths which lie hidden in any facts or principles presented to us, and of avoiding false conclusions; that is, the supposing certain truths to be contained in our principles which really do not exist in them. A good reasoner then is he who draws from the data, or premises, or evidence before him, all that may justly be drawn from them, and nothing which may not.

Now as the human mind is eager to gain fresh knowledge, positive faults in reasoning have been quite as common as negative; that is, men have come to wrong conclusions quite as often as they have failed to discover all the right ones. This evil, of positively bad reasoning, of concluding what cannot be justly concluded, arises from a want of a due acquaintance with the instrument necessarily used in every process of reasoning, namely, language. And hence appears the importance of those two studies which teach us to analyze language, logic and grammar. Language is indeed a wonderful instrument, but the very facility of using it with a certain degree of effect, for we all talk and occasionally argue, is apt to conceal from us the difficulty of acquiring a perfect command of it. We constantly find persons both speaking and writing vaguely: using words in different senses, or in no well defined sense at all, without being aware of it: and as never having analyzed the process of correct reasoning, arguing in a manner at random, and supposing that to be a proof, or an answer to an objection, which in reality is not so. These are faults for which the study of grammar and of logic is the appropriate remedy. In both we take language to pieces, examine its structure, and learn to appreciate and recognise those defects to which it is most liable. In logic especially we learn what may be called the skeleton of reasoning, that simple form which, however concealed under the more ornamental form of our common style of talking or writing, as the actual skeleton is concealed by our flesh, can never be really departed from without involving a fallacy. Knowing this skeleton accurately, we can in an instant feel, even through the covering, the flesh, so to speak, of our ordinary language, whether all the bones are in their right places; nay, we know where to suspect disorder, and by passing our probe at once to the suspected part, we can see whether or no all is sound. These suspicious parts in reasoning, to speak generally, are, first, what may be called the joint of the argument, the point of connection between the premises and the conclusion; and secondly, any abstract terms which are found to occur often in the reasoning. For men's notions about such terms being often indistinct, it happens that they do not always use them in the same sense, and thus may deceive both others and themselves by a word's imperceptibly shifting its meaning in the course of their argument, and a thing in reality different being thus passed off as the same.

Logic and grammar, then, as putting us on our guard against the fallacies of language, are the great means of cultivating our reasoning powers. And they are called formal sciences, as opposed to real, because they treat not of any particular thing or matter, but of those forms of speech and of reasoning which apply equally to all matter; they are moulds into which we may put any material that we will, but without which none whatever can be shaped properly.

Such are the studies which the mind requires to perfect its reasoning powers; that is, the powers by which it unfolds truth already acquired and recognised. All reasoning must set out from some fixed point supposed to be true; and its business is to see what other hidden truths may be developed from the truth so granted or assumed. Unhappily however the mind is not only liable to error in this process, but the supposed truth itself which is the foundation of our reasoning may have been assumed unjustly: we may be wrong in the stating of the sum as well as in the working of it. But here no formal science will be sufficient for us: for though there is one common form for all reasoning, yet things themselves are so infinitely various, and their truth is collected in so many different ways, that no one rule can be applicable to all. The judgment therefore, that power of the mind by which we take cognizance of truth, and transmit it, having stamped upon it our sanction, to our reasoning powers to coin as it were into other truths, can only be probably guided, not infallibly secured from error. But how is this guidance to be given it? How is this task, which most peculiarly deserves the name of education, to be accomplished? What is that great preparation which can dispose the mind, amidst the delusions with which we are surrounded, to fix on truth with a sure instinct, and to avoid error?

Error, according to Bacon's comparison, may originate in ourselves, or without us; outward objects may not communicate a faithful image to us, or our own minds, like a broken or uneven mirror, may distort the image presented to them. Truth may not be to be found, or we may be in no fit condition to receive it.

What then are the hindrances in our own minds to receiving truth? Bacon divides them into three principal classes, which he calls the spectres or phantoms of the race, of the den, and of the market-place. The fancifulness of these names is characteristic of the man: but their meaning is not the less admirable. The phantoms of the race are those prejudices or tendencies to error which are common to the whole race of mankind; the phantoms of the den are those which grow out of the peculiar weakness of each man's individual mind; and those of the market-place are such as arise from our communication with other men, from the vaguenesses and ambiguities of language.

With the last kind we have no concern, as they have been noticed before. The other two demand the greatest attention, but my limits will not allow me to do more than just to point out their importance. Among the common errors of our race may be noticed, 1st, that bondage of our minds to our senses, by which the visible and the present always prevail over the invisible and the absent; that great moral corruption which the Scripture calls unbelief: 2nd, that craving after general truths or principles, which makes us form theories hastily, upon insufficient evidence, and without noticing what makes against them: and 3rd, that abuse of a principle most true in itself, that truth and goodness are identical; a principle which becomes the fruitful parent of error, when, setting up blindly and imperfectly our own standard of goodness, we will allow nothing to be true which seems to us to contradict it. These three, the spirit of unbelief, the spirit of impatience, and the spirit of bigotry, are common to all mankind, and we are all more or less affected by them.

Not less important to notice are the phantoms of the den, the tendencies of each man's individual constitution of mind. For example, how great are the differences between men, according as imagination or observation has

most power over them. This difference separates the man of feeling and sentiment from the man of fact and reality; the poet from the man of science; the idealist school of philosophy from the sensualist; the admirer of names and associations from the lover of positive rights; the fanatic from the sceptic. How apt are these two classes to sneer at and rail against one another; to tax each other with folly and with hardness and low mindedness! How earnestly should we labour, if our imagination and feelings be predominant, to steady and sober them with the love of fact and reason and justice; or if observation and reasoning be our natural tendency, how heartily should we strive to soften and ennoble them by admiration, and love of the beautiful, and faith in the invisible.

These instances, for I can but just allude to them, will show the discipline which our own minds require, to clear them from the common erroneous tendencies of our nature, as well as from those which infest ourselves individually. But whilst thus making the mirror of our own minds even and pure to receive the image of truth when presented to us, there is a further difficulty still, in extricating that form entire and unsoiled from the mass of confusion and error in which it so often lies buried. There is in the first place the difficulty of getting at the truth of facts; then at the truth of opinions; and again there is the great question whether the truth of any opinion be eternal or only temporary; for it may be that a doctrine may be very true as applied to one time or place, which would be very false as applied to another. Thirdly, there is the comparison of truths, which in practice is everything; when two statements of principle are alike true in themselves, but are not both practically true with regard to us; because the less of two good things becomes a positive evil, if we follow it to the neglect of the better.

THE MANGO (*Mangifera Indica*).

The Mango (*Mangifera Indica* of botanists) is a native of the East Indies, but was introduced into our West India colonies in 1782, from a French vessel taken by Admiral Rodney, which had been despatched by the French government from the Isle of France to convey that and many other plants to St. Domingo. It is a large spreading tree with a rough bark. The sap is exceedingly resinous, and not unfrequently masses of gum, from two ounces to as many pounds, and as clear as gum arabic, may be taken from the branches or trunk. The leaves are lanceolate, from seven to eight inches long, two or more broad, of a glistening green, and when crushed diffuse a very agreeable resinous aroma. The *young* leaves are of a beautiful bright bay colour, and are thin, elegant, and exceedingly delicate. The flowers are white, tinged with pink or yellow, and, like the leaves, have a resinous smell. The fruit is a berried drupe, more or less kidney-shaped; the flesh soft and pulpy, sometimes stringy, as in the variety called *turpentine*; sweet, luscious, and very nutritive. In the mango season many negroes live almost exclusively on this fruit. It is eaten by cattle, horses, pigs, &c., and is considered very fattening. When unripe it is green, but when arrived at maturity it is of various colours, one variety being like the peach, another like the greengage, another yellow, and another red. The most common is the kidney mango. The size of the fruit varies from that of a large damascene to that of the fist of a very stout man. It is in season nearly the whole year, and is in perfection in April and May, but this period differs slightly in different parts of the West Indies. The wood is brittle, and as yet has not been put to any other use than that of firewood. The seed is enclosed in a hard leathery case, and is like a very large bean.

The foliage is inconceivably dense, and a man may be easily concealed among the leaves, and escape discovery though a very strict search be made.

A single tree will produce from two to six hundredweight of fruit, which sell in the Kingston market at the rate of about twelve for five-pence currency—about two pence halfpenny sterling; but a few miles from Kingston, and in the country parts, a basket-full, weighing from twenty to thirty pounds, may be had for the same sum, or even for the trouble of gathering, which is done by a person climbing into the tree and shaking the branches. It is easily propagated from the seed, and bears in about four years.

From the unripe fruit a product resembling arrow-root in every particular is easily obtained. The process consists in grating the fruit, forcing it through a coarse sieve, and allowing the fecula to fall into a shallow vessel of water. This removes the fibrous portion of the pulp. When the starch has subsided, the water is then gently poured off, fresh water is added to the residuum and stirred up, and to render it still purer it is squeezed through an Osnaburgh cloth. After settling, the water is again poured off, and the starch dried in the sun. In its sensible properties this product differs in no particular from arrow-root.

That a spirit similar to gin could be procured from the mango is a new discovery by a person in the island of Granada. The experiment has been successfully repeated in Jamaica, and a distillery is now about to be established there for the purpose of extracting alcohol in large quantities with a view to exportation.

The process by which the spirit is procured is simple. A vat is filled with the ripe fruit, and as much water added as will cover the mangoes. They are then allowed to remain from thirty-six to forty-eight hours, until fermentation commences, when the seeds are divested of whatever pulp adheres to them, and care taken to retain the whole of the rind and pulp in the vat; after which thirty-five per cent. of water and five per cent. of sugar or molasses are added. The whole is then allowed to ferment for five or six days, when it is transferred to the still, and the process conducted in the usual manner.

The spirit thus extracted is remarkably mild, with nothing of the pungency common in rum. It is described as approaching in taste to British gin, which is no doubt owing to the resin or turpentine contained in the rind. It is otherwise free from empyreuma, and is pleasant, and slightly saccharine. Fifty gallons, proof 25°, were obtained by the discoverer in the island of Granada from a "very inconsiderable quantity" of the fruit. The amount is not specified, which is to be regretted, but the product was considered great.

The Amusement of the Working Classes.—Nothing appears to meet the wishes of the working classes so much as cheap exhibitions of the products of machinery and models of mechanical inventions, intermixed with specimens of natural history and works of art, combining instruction and amusement. The example of Manchester has been followed in most manufacturing towns. That of the Leeds Mechanics' Institution has just closed; it was so attractive that 95,000 admissions are recorded, with receipts, at first of 6*d*., and latterly at 3*d*. only, to the amount of 2000*l*. The Society for obtaining free access to National Monuments and Specimens of Art, Natural History, &c., seemed to have moved in unison with the people's own tendencies; and it may be hoped that museums, as well as libraries, open to the people, will ere long be provided for the accommodation of every large town in the kingdom. It is pleasing to hear from the same quarter that Mr. Joseph Strutt is about to give a further proof of his anxious care of the welfare of the people of Derby. Mr. Loudon, the celebrated writer on gardening, is actually planting eleven acres of ground, which Mr. Strutt intends to give as a free gift to the inhabitants of that town for their recreations.—*Hull Saturday Journal.*

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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